

# **Examiners' Report**

## **June 2023**

**GCE Geography 9GE0 03**

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## Introduction

The overall statistical performance of this paper was broadly comparable with that of previous years, especially that of 2019. Summarising reports from the examining team, there was a general feeling that the paper had ‘worked’ in the sense that candidates could access and deconstruct the questions adequately enough to construct an argument. However, their ability to find the right evidence and support for their chosen point of view was more variable and provided the discrimination necessary in determining outcomes. Much of the evidence for this paper scoring much as the 2019 paper is provided in the feedback offered here for each of the questions. Notwithstanding the impact of the pandemic, centres have had several years to adapt their teaching methods in order to deliver the skills that are needed for this paper. Notably, that is especially the case for the two final essays which, of course, carry 60% of the paper’s total mark tariff. The improvement is gradual but measurable.

## Question 1

As was intended, this was a very accessible question. Many centres are teaching candidates to develop their initial reason effectively which is crucial for this type of 'Explain one....' question. As a result the question scored well. Most concentrated on rising population as the main driver with economic growth a close second. The main reason that some candidates did not do so well was the idea that fossil fuels are finite and therefore will increase energy demand. This odd interpretation of the relationship came up quite often. Most candidates were able to string an argument together sufficiently well to extend their basic idea sufficiently for at least three of the four marks available.

1 Explain **one** reason why global demand for energy is likely to rise.

(4)

One reason why global demand for energy is likely to rise is the growing population. The total population of the world is slowly increasing, meaning that ~~there~~ energy is <sup>demanded</sup> ~~required~~ <sup>increases</sup> to meet energy demands to ensure energy security and a positive quality of life. Therefore, global demand for energy is likely to rise due to the growing population.



**ResultsPlus**  
Examiner Comments

This lacks the necessary development – population growth is identified but then we have a list of rising energy demand to (tautologically) meet energy demands to ensure energy security, and a 'positive quality of life' for which no details are given, and finally a repeat of the first point. There isn't enough specificity here to warrant anything beyond 2 marks.



**ResultsPlus**  
Examiner Tip

Make sure that you develop points with some detail.

1 Explain **one** reason why global demand for energy is likely to rise.

(4)

Global demand for energy is likely to rise due to overpopulation. This means that more countries will have to import, extract energy resources such as coal and oil to provide electricity for new homes, oil for transport, more food, shelter, clothes all have an energy budget to produce these necessities to meet demand. This is prevalent in emerging countries where an increase in affluence and fertility rates ensures better quality of life leading to a rise in energy.



**ResultsPlus**  
Examiner Comments

This answer is comprehensive with a long list of impacts of 'overpopulation' including the use of coal and gas to supply electricity and oil for transport as well as increased demand for manufactured products such as clothes. It is worth remarking that the negative implications of the word 'overpopulation' are not an issue here.



**ResultsPlus**  
Examiner Tip

This example uses specific impacts of more people and is well focused on the question asked.

## **Question 2 (a)(i)**

Candidates generally did well on this question, and many have been well trained to show their working. Some continue to ignore instructions on the number of decimal places required for the answer, which was the main reason for the failure to pick up both of the available marks.

## **Question 2 (a)(ii)**

This question distinguished effectively between those who knew what the 'interquartile range' is and those who did not. This second group usually offered  $83-59 = 24$  as their answer which is indeed the range but not, of course the 'interquartile range'. Some of those who understood the term struggled to get much beyond working out the median to complete their answer. There were many approaches to demonstrate working, which could be credited. It is an obvious truism that across the three examination papers a variety of statistical methods be examined and thus candidates need to be comfortable with these skills.

## Question 2 (b)

This question was answered well by many candidates. There was a significant range of weaknesses with this data and candidates were spoilt for choice. Most identified that all the countries included in Table 1 were richer, developed countries. That was also drawn attention to in the preamble to the question which identified them as '...11 developed countries'. Many also addressed the absence of any information about the sample size, date and circumstances in which this survey was conducted. The invitation to be sceptical was also intended to assist candidates when they revisited a different version of this resource later in the paper; an invitation that many ultimately took up in their responses to Q6.

(b) Explain why the data on Table 1 may not be a reliable guide to global opinions about the threat of climate change.

(4)

This data was collected back in 2019, which isn't as reliable as collecting data now, because people may have developed ~~the~~ different opinions ~~on~~ on climate change in the past ~~for~~ four years. ~~The~~

This data only focuses on developed countries. There is no input from developing or emerging countries. This leads to a misperception of the general view of climate change since this survey hasn't been carried out everywhere.



**ResultsPlus**  
Examiner Comments

This candidate offers two reasons to doubt the reliability of this information. The first legitimately suggests that opinions may have changed over the past few years whereas the second identifies, as so many did, the narrow selection of countries.



**ResultsPlus**  
Examiner Tip

Always read the whole question – that bit at the start that precedes the question itself often contains useful information as it did in the question.



(b) Explain why the data on Table 1 may not be a reliable guide to global opinions about the threat of climate change.

(4)

because different countries may measure climate change differently, ~~therefore~~ and so opinions of climate change may vary. This creates data to not 'line-up' as different people may have a different idea of threats caused by climate change than others. Therefore creating unreliable data -



**ResultsPlus**  
Examiner Comments

There is a single idea here, a legitimate one that is extended for 2 marks but candidates need to recognise that for a 4-mark question one idea with an extension is unlikely to be enough.



**ResultsPlus**  
Examiner Tip

Make sure that you know the difference between 'Explain one...' questions and 'Explain why...' questions.

### Question 3

Candidates engaged well with this question. The relationship was clear enough, showing that, both in the long-term and in the shorter-term since the onset of the industrial age, population growth and land use changes were closely related. Successful answers used information extracted from the resources which allowed for effective demonstration of AO3 skills. To access high level 2 or level 3 marks the key was to keep the focus on the relationship, rather than population growth or land use change separately. Stronger answers were characterised by the use of the candidates' AO1 knowledge and understanding to help support their analysis of the relationship. The most abiding curiosity of some answers was a tendency to focus on the growth of urban land use which, in reality, and as is clearly shown in Figure 2, only accounted for 2% for the total land area by 2018. Despite this it was cast in the role of the main element in land-use changes. A more forensic analysis was inevitably more likely to focus on forest clearance to make way for agricultural land in order to feed the (growing) global population; again clearly demonstrated on Figure 2. Some candidates were also able to note that population growth is slowing down. Recognising this was also likely to have been very helpful background information when tackling both Q5 and Q6 later on the paper.

### 3 Study Figure 1 and Figure 2 in Section A of the Resource Booklet.

Analyse the relationship between global population growth and land-use changes.

(8)

Figure 1 shows an increase in world population with the 20th century experiencing a huge rise in annual growth rate. This marks the era of global shift and increasing industrialisation. Figure 2 complements this with the presence of urban built up land. There is also an increase in crops and a 10% increase in grazing land in 1900s which is to feed the growing populations. There is a correlation between deforestation and growth of population as more deforestation is done to provide urbanised land and farmland to keep up with demand. There is a decrease in wild grasslands and shrubs which complements the idea that population growth decreases biodiversity. An increase in Quaternary / Quinary industry in the 21st century has given rise to SEZs which are highly urbanised and urban cores like London which until recently have been almost entirely deforested. However the Queen Elizabeth park has been described as 'London's green lung' highlighting modern <sup>post-industrial</sup> views towards afforesting in order to prevent permanent damage to the planet by our levels of deforestation. This is complemented by Figure 1 where the annual growth rate

is decreasing from around 2000. This is due to a rise in global GDP from \$6430 to \$120 trillion which is giving rise to a global middle class (predicted to grow from 2 billion to 5 billion by 2030) which have on average lower birth rates as seen in Japan which has an ageing population.

(Total for Question 3 = 8 marks)



**ResultsPlus**  
Examiner Comments

This is a strong response that identifies the relationship but also acknowledges its negative impacts on biodiversity. The candidate also offers a thoughtful AO1 reflection on how cities in general and London in particular, have become 'greener'. As it happens there are more trees than people in the UK's capital; a memorable 'fact' it itself.



**ResultsPlus**  
Examiner Tip

Relationships may be positive or negative, or of course there may be no statistical relationship at all, but please remember that correlation is not causation. It is just a suggestion that more research might need to be done.



3 Study Figure 1 and Figure 2 in Section A of the Resource Booklet.

Analyse the relationship between global population growth and land-use changes.

(8)

Figure 1 is a graph that presents both the cumulative growth and percentage growth of the global population from 1700 to a predicted 2100 data.

Figure 2 is a bar chart showing land cover / use variations over 5 select time periods.

These 2 figures can complement each other, and we are able to analyse a relationship between them.

In 1700 the population was 600 million with a growth rate of approximately 0.25% each year, at the time global land use was 52% forests, 38% grassland, 6% grazing land, 3% agricultural. The 1700s marked the start of industrial civilization with life-prolonging technologies and techniques, such as more effective healthcare, this explains the growth in population to 1900 - which reached less than 2 billion, a massive growth.

Thereover In 2 centuries agricultural land use increased 5% and grazing land increased 10%. These land use changes are a sign of rapid population growth, to support the people more food had to be grown.

A reduction of forest cover and grassland primarily occurred in the 20th century, where mass population growth occurred, reaching 2.1% growth at its height in 1968. It can be assumed that this population growth provoked the use of agricultural land use, as well as urbanisation. In conclusion, population growth has correlated strongly with

(Total for Question 3 = 8 marks)

land use changes through analysing the figures exclusively.



**ResultsPlus**  
Examiner Comments

This is a fairly typical mid-level 2 response in which there is strong AO4 but less well-developed AO3.



**ResultsPlus**  
Examiner Tip

Always add your own knowledge where you can in these 8-mark 'analyse' questions. The best part of this answer is in the second paragraph.

## Question 4

By design this question offered a rather greater challenge than Q3. This was because 'the variations in European forest cover' were harder to disentangle. From the outset those candidates who had recognised the enormous land-use changes from 1700 until today were at an immediate advantage. However, the text also gave a very strong steer to the probable causes of these wide variations in European forest cover which provided a ready-made framework for those candidates who had been scrupulous in reading, and annotating, the resource booklet. The key extracts are shown below;

*More than half of Europe's forests have disappeared in the past 10,000 years. The main reasons are the demand for agricultural land and wood for fuel. As economies grow and diets change, forest area declines rapidly before recovering through afforestation in post-industrial economies.*

*The differences in modern Europe are partly explained by climate, geology, relief and population density but also by land management policies and practices.*

Candidates who were confident in suggesting that there is no clear pattern, but who were able to identify some clear variations within Europe, did particularly well. AO3 skills could be demonstrated effectively when outlining the extent of these variations, and to analyse the possible causes the ability to deploy their own understanding (AO1) was paramount. The most successful level 3 responses frequently took the hint the social and political factors played a key role and could build on the Norway/Scotland contrast covered on page 5 of the resource booklet.

#### 4 Study Figure 3, Figure 4a and Figure 4b in Section A of the Resource Booklet.

Analyse the variations in European forest coverage.

(8)

Europe has significant variation in its forest coverage. For example, in Figure 3, Scandinavian countries of Sweden and Finland have the highest areas of forested land (Sweden 68.9%, Finland 73.1%). This trend is consistent with North-<sup>East</sup> Europe, ~~North East Europe~~ such as Russia (49.8%) and Balkan countries such as Estonia (52.7) and Latvia (54.0). Much of North-East Europe was a part of the communist USSR while most western countries went through significant stages of globalisation and development. This could suggest why there are such significant variations in the total forested land area with the UK being very minimal with 13.0% compared to the substantial areas of North East Europe which ~~was~~ <sup>land was</sup> cleared for industry such as factories or office space <sup>and to produce fuel</sup>. However, it can be down to climate as well as human factors. Iceland for example has 1.1% forested due to 60% being glaciers and rocky deserts, not the right environment for forested land, showing variations in European forest coverage.

Figure 4a and b compare southwest Norway and north west Scotland. These both have similar climates but vary in their forest coverage. As Figure 4a shows, there is dense forest coverage in Norway (as shown by its 33.2% figure). This is due to Norway having a mix of incomes such as tourism, agriculture, hunting and fishing. Furthermore, Norway's main energy resource is HEP, and so fuel from wood is less common so therefore have higher areas of forested land. In Figure 4b however, Scotland has



very little forested land, compared to that of Norway, it main income  
was ~~based~~ based on hunting and shooting, so forested land had to be  
cleared to open moorland to increase visibility and easier hunting, showing  
variation in European forest coverage.



**ResultsPlus**  
Examiner Comments

This is obviously a very strong response underpinned by a good AO1 knowledge of European geography. Both physical and human factors are offered and the level of complexity in the answer suggests that the outcomes are likely to be variable in both time and space.



**ResultsPlus**  
Examiner Tip

Use the whole resource booklet – instructions to reference Figures 3, 4a and 4b in this question obviously include the text as well as the maps and photographs.

4 Study Figure 3, Figure 4a and Figure 4b in Section A of the Resource Booklet.

Analyse the variations in European forest coverage.

(8)

Figure 4 A&B Shows contrast in  
forest coverage due to land use.

Scottish estates have large land ownership  
and have therefore used agriculture  
for economic benefit like turning area  
into open moorland for hunting.

In South west Norway in high  
for a mixed agriculture economy  
leads to a demand for forests  
and sustained forest development  
also due to smaller farm estates  
than in Scotland and more sustainable  
practices are land usage.



**ResultsPlus**  
Examiner Comments

To improve performance it is helpful if future candidates are exposed to answers such as this one, and are asked to suggest **one** way in which it might be improved. Which element of the question has been ignored?

Obviously, what is missing here is any reference to Figure 3 and the accompanying text which is referenced in the earlier introductory remarks.



**ResultsPlus**  
Examiner Tip

Read the text as well as using the other resources. The text always has important steers and hints.

## Question 5

It has been a repetitive theme of this annual report to remind centres that the more often that they can impart the message about the importance of AO1 and AO2 in answering both this question and Q6 the better it is. The characteristic level 2 answer was heavily reliant on extracting AO3 information from the resource booklet but without very much associated AO1 knowledge and understanding or AO2 deployment of that information to answer the question posed. For example, most candidates described the strategies to mitigate climate change, making good use of the resources in the booklet, but not so many added parallel case studies from across their course of study. More impressively, some provided strong links to the carbon cycle in order to evaluate the effectiveness of these strategies. At their best these worked very well indeed whilst repeated assertions that contrasting strategies were needed because the more strategies the better lacked conviction.

Some answers tended to evaluate the effectiveness of the strategies, rather than the view in the question. These answers often were commonly credited at level 2 because they were only partially coherent in terms of the question posed. Others tried to argue that only one strategy was sufficient without having any meaningful evidence to support that view. Thus, the 'on the one hand' but 'on the other hand' approach was unhelpful with this question.

Level 3 answers engaged directly with the view. Sometimes this was done in an extended conclusion. Candidates identified a range of arguments for the contrasting strategies, not least the idea that the weaknesses of individual strategies could be balanced by the strengths of others; different strategies are required by different sectors; different countries have attributes that lend themselves to different strategies; some strategies are more proven and reliable; some strategies have greater popular approval. Answers that introduced and evaluated at this level of complexity were a pleasure to mark.

Sometimes, candidates evaluated the view in mini-conclusions following an assessment of the effectiveness of individual strategies. This could also achieve level 3 .





developed world to connect with each other. This ~~it~~ would mean contrasting strategies are best suitable. ~~Am~~ natural geo engineering contrasts the idea of biofres as they promote reforestation and rewilding to achieve the same goal (figure 3). Therefore by a country adopting natural geo engineering strategies like growing trees (figure 7) as well as nuclear power, which provides highest medium density out of all <sup>recyclable</sup> ~~renewable~~ energy source, 2 parts of the Climate crisis 'deforestation and ~~the~~ burning of fossil fuels'. While nuclear energy and natural geo engineering contrast as grassland would have to be changed into ~~the~~ power plant, the overall affect while both are in practice will be majority beneficial. This could then offer an alternative to fuel as the power density is high <sup>(figure 6)</sup> and <sup>(figure 6)</sup> extract inevitable gases natural, without more corroding factories.

However many contrasting strategies is expensive and can mean changes to land use further the problem reducing effectiveness. Spending money on reduction of fossil fuel production for a developing country is only possible with real funding. 21% of ~~the~~ ~~global~~ global fossil fuel usage is to industry while 25% to power and 24% to agriculture and land use. This means <sup>most</sup> would come from industry driven economies like

China. Any amount of reduction means effectiveness and singular strategies can provide that.

However by using contrasting strategies all bases of inefficiency can be covered. Figure 6 mentions that wind power and solar are mostly unreliable at times as they depend on the climate. Meaning during low rates of output demand will not be met creating a reliance on fossil fuels further. By also adopting CCS or SRM they ensure emission of CO<sub>2</sub> are caught /deflected from the atmosphere, meaning by using a fossil fuel alternative like wind which is reliable sometimes other times not, CCS or SRM can still be beneficial in preventing the emission when using fossil fuel to meet demand.

Therefore contrasting the strategies, one being complete mitigation the other being a mitigation adoption, all CO<sub>2</sub> emissions are reduced.

However Contrasting strategies However do seem to cut run each other. For example using natural geo engineering plants to mitigate like planting trees will be eliminated if the biofuel solution is taken on which requires removal of forest for not only pellets but also plantations.



(figure 6). By adopting these contrasting strategies the effectiveness will be little, it depends on the country's development. If a country with excess of forested area may see these as beneficial options. But they may cancel each other out and result in a positive feedback loop.

Although contrasting strategies are would mean more ability for future decisions to be made, by a country diversely picking how to combat climate change there people in the future will know what to do. There would be beneficial for future society as well as modern as the issue of climate change will be dealt with quicker.

Overall contrasting strategies are the most beneficial as they cover for losses that some mitigating factors might have like renewable. But it also shows the real ability of all the mitigating strategies. Only adopting a few <sup>sunier</sup> ~~renewable means~~ like nuclear, solar ~~and~~ wind, the abilities of CCS or SRM or natural geo engineering will not be tested. ~~over~~ <sup>over</sup> ~~in~~ <sup>in</sup> ~~renewable~~ <sup>renewable</sup> contrasting is the most beneficial



After a brief definitional opening and a first paragraph that outlines the obvious advantages of multiple mitigation policies this candidate offers a range of examples of policies and their possible deficiencies. The use of 'However...' to qualify comments and to add a note of caution here or there shows strong AO2 and some imported knowledge and understanding from their wider studies. The essay is well-organised and well-focused, concentrating on the issues that arise from an over-reliance on one technique. The strongest passages are those where the candidate constructs a debate around, for example, the externalities surrounding natural geo-engineering, showing an ability to address the potential tensions in these strategies.



For the longer essay questions always make a plan that identifies the focus of the question.



5 Study the resources in Section B of the Resource Booklet.

Evaluate the view that to be effective the mitigation of climate change requires many contrasting strategies.

(18)

Climate change is a natural event which takes the influence from humans as more greenhouse gases are emitted to the atmosphere, there are more gases trapped in the atmosphere, blocking heat and increasing the global climate. Climate change can be mitigated through the use of many factors which may impact society.

Mitigation of Climate Change can take place by reducing the large consumers of energy such as unnecessary travel through cars, and reduce the emissions to cars. As we can see there is 47% of energy from the transport sector spent on cars meaning they have a large dominance and impact on the ~~world~~ fossil fuel consumption. To have a successful mitigation of climate change there can be an increase in electric cars or more use of bus which will reduce the fossil fuel emissions. However, not every person wants to reduce their car emissions or be asked to afford a new car. Therefore there has been some improvements

Over time such as electric cars like Tesla, but has not helped reduce climate change by a lot.

Climate change can be reduced slowly and effectively through finding substitutes for oil which is being used extensively in transport and farmland. As we can see from Figure 5, 24% of fossil fuels are used by agriculture and land use. This can be reduced by adapting to a solution to oil which is renewable and does not cause harm to the environment by trapping in emissions. Many sources of energy can be put in place such as nuclear power, solar power and wind power. However issues do arise with the development of these non renewable sources such as safety risks and storage problems for nuclear power after many past nuclear power stations have exploded. Therefore, mitigating climate change comes with many drawbacks and advantages.

Mitigating climate change by relying on the dependency of the renewable energy can cause many issues to arise with accessibility to these energies. Solar power and wind power are hard to manage as they do not always provide energy a constant energy supply as of the weather conditions. There is also a high demand meaning more will be needed to provide for larger scale population.

Another way climate change can be reduced is by implementing a carbon capture system which is able to trap  $\text{CO}_2$  which is trapped in the atmosphere underground which will not trap heat in the atmosphere and increase climate change. However, it is a large cost to implement and unattractive, which may prevent people from wanting it, the carbon capture also pollutes the soil which will degrade and destroy the soil over time.

However, they are very effective at removing carbon dioxide stores and effectively. Therefore, carbon capturing can be put in place nationwide to reduce  $\text{CO}_2$  emissions.



In conclusion, climate change can be managed and mitigated successfully over time by research and investment into finding sustainable replacements without any other issues arising. Another is implementing the carbon capture to help remove the current CO<sub>2</sub> store. Implementing plants and green land will help remove CO<sub>2</sub>.



**ResultsPlus**  
Examiner Comments

This answer, as with many others, leans very heavily on the resource booklet and is too brief to cover very many angles in the question. The unfortunate use of 'natural' in the opening paragraph is unhelpful. There are some useful comments made, not least the point about the costs of electric cars at the foot of page 10 which is thoughtful. However, the essay then mentions a few issues with non-renewable energy which offer opportunities for development that are generally not taken. An example of a missed opportunity is the reference to 'high demand for solar and wind power' which is not expanded. This is a feature of level 2 essays and it is a useful teaching technique to ask candidates to suggest edits to an essay by identifying sentences that could be removed without impacting on the mark awarded whilst offering replacement sentences that add value.



**ResultsPlus**  
Examiner Tip

Always identify the keywords in a question – in this example 'contrasting' is one that many neglected. How do the strategies contrast?

## Question 6

As is intended the incline of difficulty across the paper inevitably makes this final question the most demanding. There is anecdotal and statistical evidence that candidates are more aware that they need to devote a sufficient tranche of time to do this question credit.

Candidates who tried to evaluate the statement struggled to evaluate the view. There are two ideas: 'more serious' and 'more challenging to solve'. Candidates who addressed these ideas separately tended to write more coherent arguments. The booklet had many rich resources to evidence these debates and was used effectively by most candidates. The main discriminator was how effectively candidates focused on the statements, rather than the AO1 or AO3, which was generally quite strong. In other words how good were they at establishing links that could be constructed into an argument.

There were good opportunities to make these links to ideas from across the course of study, from the water and carbon cycles. This was a helpful way to consider the seriousness of the two crises. There were good opportunities to link to globalisation, in particular global governance of these crises. That also allowed some to comment on how much geopolitics and superpower relationships plays a part in environmental decisions making at governmental level.

A risk was that some essays lost sight of the 'crisis of biodiversity' entirely. That was understandable given the high-profile political debate surrounding climate change and the active and ongoing realignment of many policies since the re-emergence of the debate surrounding energy dependency and energy security provoked by the escalation of the Russia-Ukraine conflict. Inevitably candidates had more understanding of the climate change debate and the apparent tensions with tackling that without impacting on economic growth. However the underuse of the resources that focused on biodiversity loss was notable especially at the lower end of the ability range.

Perhaps unsurprisingly the overwhelming view was that both issues were serious but maybe climate change was harder to fix. Almost all level 3 and level 4 responses noted that they were interrelated issues but very few offered the view that climate change was part of a wider environmental crisis. For the few who did argue this, it provided a very helpful route to considering which was more challenging to solve. The role of scale in influencing the effectiveness of solutions was used to great effect by many candidates.

As always with these 24-mark questions, candidates that allowed time for a considered conclusion that clearly evaluated the view had the greatest chance of achieving a level 4 answer.

- 6 Evaluate the view that the crisis of biodiversity loss is both more serious and more challenging to solve than climate change. (global?)

(24)

~~Since the industrial revolution, the levels of~~

Since 1700, the human population has increased in size by 13 times. This has put significant stress on our Earth's natural resources, causing problems such as biodiversity loss and climate change. Some argue that biodiversity loss is both more serious and more challenging to solve than climate change.

In 1993, American biologist E.O. Wilson suggested that humanity will face a 6<sup>th</sup> extinction event, with an estimated 30,000 species disappearing yearly. Currently, extinction rates have accelerated 100 x to 1000 x faster than any other time in the history of the planet (fig 8). This is due to many species being overhunted, overfished and overharvested for our food, clothing and medicine. ~~As more species become going extinct~~ Commonly, the problem of overfishing can be attributed to the "Tragedy of the Commons", and is often explained ~~that~~ as an impossible problem to solve, because ~~it is difficult to apply private property~~ the good is non-excludable. Indeed, it is difficult for governments to impose laws ~~that~~ that limit the amount of fish fished from the sea, as well as ensure that



they are properly implemented through <sup>regular</sup> checking. Some governments that have attempted to do so end up seeing fishermen dumping the dead fish that they overfished back into the sea to avoid breaking the law, instead of trying to fish less. This goes against the intention of the law, and does not <sup>reduce</sup> ~~make~~ biodiversity loss, ~~meaning it~~ showing it is very challenging for gov't to successfully reduce biodiversity loss. Moreover, ~~the~~ overfishing causing extinction of fish is a very serious problem, because ~~many people~~ 3 billion people globally rely on fish for 16% of their protein intake, with fish ~~per~~ being a cheap choice for many in developing countries. Aquatic ~~biodiversity~~ biodiversity loss may therefore lead to malnutrition, and is a very serious problem.

On the other hand, climate change is also a very serious problem that is challenging to solve. Climate change is caused by increasing GHG emissions that lead to global warming. Due to the rise ~~of~~ of the middle class in many developing countries like China, there is a growing demand for energy to produce manufactured goods and also household consumption. For example, the car ownership rates in China increased from 1 in 100 owning a car to 1 in 5, meaning more people demand fuel for their cars. Amongst the 14% of global fossil fuel usage for transport, cars take up 47%, which is the largest proportion in comparison to other transport methods (fig 5).

Moreover, offshoring production to China means that they demand increasing energy for manufacturing processes. It is said that China is the world's largest consumer of coal, and produces the greatest amount of carbon emissions ~~in~~ in comparison to other countries. These contribute to increased GHG emissions, leading to ~~sea~~ climate change. ~~It is~~ It is challenging to solve because the success of any global actions regarding climate change is highly dependent on China, a country that is not always willing to cooperate internationally due to differing political beliefs. However, it is important to note that extracting these fossil fuels are also another main cause of habitat destruction that leads to the problem of biodiversity loss. Through reducing ~~of~~ GHG emissions by fossil fuel consumption, both climate change and biodiversity loss can be solved.

Additionally, land use changes is another major factor leading to climate change. The conversion of many forested and wild grassland and shrub to grazing land ~~for~~ and crops have been significant in the last centuries. Since 1700, 14% of natural landscape have been lost, and 31% of land is now grazing land (fig 2). This is due to the rise of the middle class and growing population, causing ~~a~~ higher demand for meat as more people can afford it. However, ~~the~~ ~~cutting down of forests~~ meat such as beef and lamb have <sup>more</sup> ~~high~~ land needed to produce 1000 kcal than



vegetables. An approximate of .92 times more land ( $m^2$ ) is needed to produce beef than tofu, a meat alternative (fig 9). If people changed to vegetarian alternatives and reduced meat consumption, ~~the~~ ~~for~~ less ~~for~~ deforestation would occur, so more  $CO_2$  will be absorbed by trees through photosynthesis, so there would be less  $CO_2$  atmospheric concentration. ~~#~~ the problem that would be caused if people continued to deforest for meat production is very serious, as warming temperatures ~~may make the~~ causing climate change may make the ~~E~~ Earth inhabitable. Extreme weather patterns causing drought, flood <sup>or</sup> sea level rises may destroy lives and property. However, ~~the~~ <sup>the</sup> problem is serious, it is also very challenging to solve. It requires global cooperation to reduce forest loss and meat consumption. Brazil, where the Amazon is located, experiences changing political parties that have differing stances on conserving the forest, making progress unreliable and not sustained. Moreover, it is impossible to forcibly control people from eating meat, ~~the~~ and only solution is to educate them, which may not always work. Therefore, it is challenging to solve ~~this~~ climate change this way. However, it is also important to understand that the forest loss not only contributes to climate change through increased  $CO_2$  emissions, but the destroyed forests also affect over 80% of land species. It is estimated that tropical rainforests, like Amazon, are rich in global biodiversity and contain 365

tree species in a hectare and 1200 different species of beetle ~~than~~ on a single tree (fig 8). ~~The~~ Deforestation in the Amazon would also cause significant biodiversity loss, on top of a worsening climate change problem.

In conclusion, it seems the crisis of biodiversity loss is on a more regional scale and would affect less people. The effects of this crisis may also be felt with a longer time lag, making it less serious than climate change. On the other hand, climate change is more serious as it affects everyone globally and may make Earth inhabitable. It is more challenging to solve too, because it requires global cooperation. However, it is important to note that through solving climate change by reducing fossil fuel usage and land use changes, the problem of biodiversity loss can also be solved. It is indisputable that the problem of biodiversity loss is linked to, and caused by climate change.



This is a very impressive essay that is clearly a level 4 answer as it comfortably meets the six bullet points in the level 4 descriptors. The candidate builds a case through the essay that is well-supported and built upon material covered across the specification. The opening debate about the 'tragedy of the commons' is excellent. Recognising that tackling climate change requires international cooperation, and that may not be possible as governments have different goals, is supported by data from China referencing car ownership rates. It is worth noting that this data is not entirely convincing (no dates are offered) but the sense of it is fine and, in the context of an examination, it is perfectly acceptable. It is also worth noting that the 'China blaming' focus of this section is also questionable, as it would be questioned in a classroom debate, but in this context it clearly adds a positive dimension to the essay as a whole. There is a clear attempt to differentiate between the scale of the challenge and especially how these two challenges overlap and interrelate, and the difficulties of solving these crises. The conclusion drawn is not entirely supported by the material offered as evidence earlier in the essay which makes it less than fully coherent in places. It is that minor criticism that keeps it from scoring full marks. A minor edit of the final paragraph would have solved that.



In answering almost any essay question, it is worth recalling that answers are likely to be made more complex because of spatial and temporal variations. A strategy might offer a short-term fix but might have negative long term consequences. Another policy/strategy might be perfect for urban areas or richer communities but not for rural communities or areas of high deprivation. These ideas will add complexity to your argument so use them whenever you can.



- 6 Evaluate the view that the crisis of biodiversity loss is both more serious and more challenging to solve than climate change.

(24)

Biodiversity is the term used to describe the diversity of organisms in an area so is an area has lots of species it can be described as very ~~diverse~~ Bio diverse.

One approach to stop the loss of Biodiversity is through Vegetarian and Veganism, this is shown in the resource booklet in Figure 9 and above. Figure 9 shows the difference in the amount of land needed for different food products and meat requires the most space so the view of Veganism is that a lot less space is required to produce the same calories in Vegetables and Plants compared to Meat products. An example of this is shown in Figure 9 with Rice only requiring  $0.76 \text{ m}^2$  for 1000 kcal whereas beef requires  $119.49 \text{ m}^2$  so over 100 times more for the same nutritional output. This can be contradicted though because the impact on climate change for rice is greater due to all the planting maintaining and ploughing compared to meat.

Figure 8 shows species extinction rates from 1500 - 2000 which shows a sharp change until around

1900 When the Industrial revolution occurred more land was very quickly changed use and habitats destroyed and CO<sub>2</sub> emissions dramatically increased. This shows one sector having a big effect on these extinction rates.

Extinction rates are a sector which support the statement showing that Biodiversity loss is more serious and challenging to solve than Climate Change because when animals become extinct it is almost impossible to get them back whereas there are methods to remove carbon from the atmosphere and reduce emissions but not to stop extinction.

Political opinions also have a large influence on whether Biodiversity or Climate Change are sorted first and how they are sorted. Figure 10 shows these Political Views and show in general that Left Wing people agree more with the fact that about Climate Change being more of an effect than what people with Right Wing views think.

Land use is a large sector which will affect levels of Biodiversity for example Figure 4a is a Woodland area with lakes and hills which means this will have more Biodiversity than the

Deforested landscape shown in figure 4b as there is not many species shown in this area.

One method to ~~help~~ reduce loss of biodiversity and reduce the impacts of climate change is by reducing deforestation and increasing reforestation which becomes a carbon sink as trees absorb lots of carbon and also create more habitats for species.

Other methods like reducing the use of fossil fuels will not only affect climate change but also loss of biodiversity, e.g. is that carbon in the ocean is destroying coral reefs so by reducing this it means that biodiversity in these oceans survives and climate change is reduced.

In conclusion I feel that <sup>loss</sup> biodiversity is harder to combat than ~~the~~ climate change but both can be combatted and slowed down or even prevented through simple methods as discussed above and shown in the resource booklet. Through strategies like carbon sequestration and reflectors in orbit.



Unusually, this essay is focused more on biodiversity loss than it is on climate change. There are valuable points made about why there are complexities in addressing, for example, the issue of the potential of dietary changes in addressing habitat loss. The point made referencing the 'costs' of rice is thoughtful but is also a missed opportunity given the contribution of wet-rice to methane production.

However, the main issue with the essay, which is strongly self-limiting, is the failure to address the differences between the seriousness of the two crises and the ability to solve these crises. The final page offers a few highly generalised and unsupported statements asserting a view but lacking any evidence to support that view. By conflating the two issues that the question identifies the candidate makes it very difficult to access the higher levels in the mark scheme.



Always give yourself enough time to write a conclusion. A good essay can often be judged by its first and last paragraphs where you set the direction of your argument in the introductory paragraph and pull it all together in the final one.

## Paper Summary

This report is intended to pass on the key lessons of the 2023 9GE03 paper using candidate responses to highlight issues and provide potential advice to centres as they seek to improve outcomes for their candidates.

Key elements include:

- An awareness of the AOs
- The best use of the resource booklet
- Time-management issues in writing essays
- Cliches and complexity in answers



## **Grade boundaries**

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